Senator Stevens: Then when it is, it will take its place, right? When it is cheaper, it will take its place. But right now, the conversion from what we have got now with analog to digital should not be so expensive that it takes in the next generation of going to your computer box. If you do, you are going to delay it another 15 years.

Mr. Ehlers: No, I do not believe you will, Senator. The point is simply the last one I made, that the most important dollar decision here is the one that affects consumers. If you adopt a standard in which millions and millions of consumers go out and buy what you refer to as the dumb, inexpensive box -- which would be $500 -- which has a useful life of 15 years, and 5 years later that box is obsolete, they will have thrown away two-thirds of the value of that box. You are better off getting a slightly more expensive -- not very much more expensive -- smart box, which will be useful for the entire 15 years. So the next cost to the consumer will be less.

But I also do not want to say that we want to mandate those standards. The timing issue is the political issue I mentioned that says we have to move quickly. What I would suggest is that we adopt standards as quickly as possible, but design those standards to move as quickly as possible to the total digital format, dealing with the two technical issues I outlined -- the progressive display and the protocols to

provide for error-free transmission of data. And adopt standards as quickly as we can

That may include some dumb boxes for a few years, and people will buy them with full knowledge that they may be obsolete in 5 to 7 years. But try to move the standards in the direction of the more advanced standards as quickly as possible.

The dilemma we are in is the timing issue. Because we do want to move rapidly. And that mandate is going in the direction that you seem to prefer. But I am saying let us try, at the same time, to make those standards, set those standards as to what they are going to be fairly shortly, so that the computer industry and all the others can concentrate on developing the inexpensive smart boxes that will be the ones that will last a long time and be useful for a long time.

Mr. Chairman, Senator Stevens made his point. I had basically finished my testimony already, so I have essentially nothing to add.

The Chairman: We thank you

Mr. Ehlers: I do apologize again for not having been better prepared. I just wanted to give you a synopsis of where I think the problems lie what issues you should examine in this committee, and look at those particular issues. I am not here in opposition to Senator Coats' proposal or advocating a particular point of view. I just think these are

issues that you have to look at as a committee and identify, because we are talking about billions upon billions of dollars for consumers, as well as the many billions of dollars you are talking about for the transmission industry and the sale and allocation of spectrum.

So these are major issues that have to be examined by your committee, by our committee and the FCC. And I hope we can come up with a good solution and do it very quickly, because we do have to move rapidly on this.

Thank you very much

The Chairman: We thank you very much.

Unless some of my colleagues have questions, we will proceed to our first panel

Senator Dorgan: Mr Chairman.

The Chairman: Yes.

Senator Dorgan: I have no questions, and we could ask the first panel to come forward I would like to ask unanimous consent to put an opening statement in the record, and make just one observation while the next panel comes forward.

The Chairman: Let us call panel one forward. And we thank you very much, Congressman Ehlers.

Mr. Ehlers: Thank you.

The Chairman: Go right ahead.

Senator Dorgan: While the next panel is coming forward,

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COMMERCE, SCIENCE AND TRANSPORTATION

# UNITED STATES SENATE

HEARING ON
BROADCAST SPECTRUM AND TELEVISION STANDARDS

Thursday, June 20, 1996

Washington, D.C.

ALDERSON REPORTING COMPANY
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STATEMENT OF ROBERT W. STEARNS, SENIOR VICE PRESIDENT, TECHNOLOGY AND CORPORATE DEVELOPMENT, COMPAQ COMPUTER CORPORATION, HOUSTON, TEXAS

Mr. Stearns: Good morning, Mr. Chairman and members of the committee. I am Bob Stearns. I am Compaq Corporation's Senior Vice President of Technology and Corporate Development, and also its chief technologist. In past years I have testified before Congress and the FCC on a variety of communication issues of importance, and greatly appreciate the opportunity you afford us today to testify.

Compaq, located in Houston, Texas, and founded in 1982, is the world's supplier of personal computers, and the fifth largest computer company overall in the world, with 1995 revenues of $15 billion. We have succeeded in what I believe is the most intensely competitive industry in the world today. I might point out that our revenues are more than the combined sales of the three largest TV networks.

We have built Compaq's market position with an emphasis on open and voluntary technical standards and with a constellation of strategic partnerships, such as with Microsoft, that have permitted us to create products that truly meet real consumer needs. It is perhaps worth pointing out that during the period in which the FCC has been considering advanced television, sales of consumer PC's in the United States have increased from zero to 22 million annually.

With that as background, here are Compaq's views on the Electromagnetic Spectrum Management Policy Reform and Privatization Act.

To begin, Compaq agrees with Senator Pressler that spectrum is a valuable resource that should be made available on terms flexible enough to encourage its most innovative and efficient use. Outmoded inefficient uses of spectrum, such as analog NTSC television broadcasting, should be replaced as soon as feasible by uses that will better serve the marketplace and the public interest. Those to whom spectrum has been entrusted have an obligation to invest in the future, even if that means doing business in new and somewhat unfamiliar ways.

I should mention that Compaq remains noncommittal about whether spectrum currently used or reserved for broadcast should be actually auctioned. But we do believe that the day when this spectrum can be returned to the Government for reuse will be postponed by years if the FCC adopts the proposed Grand Alliance standard for digital television broadcasting. Let me take a minute to focus on the Grand Alliance proposal.

Compaq believes this proposal is seriously flawed. FIrst, it is not a standard at all, but an amalgam of all the different formats that were being developed by the companies that joined forces to form the Grand Alliance.

Second, contrary to the way it has been portrayed, it is

not a best of best proposal, nor is it flexible. Instead, it is merely a grab-bag of 18 different mandated formats. And several of these formats incorporate outmoded, inefficient, and non-computer-friendly technology. This frankly injures the American computer industry, an industry that leads America's competitiveness in the world, and creates valuable jobs right here at home, and not in Europe and in Japan.

Thirdly, if adopted by the FCC, the Grand Alliance proposal would straightjacket the future of digital broadcasting by effectively enforcing digital receivers to decode all 18 formats, and that would not be in the consumers' best interest. Why? Because consumers would be forced to buy receivers capable of receiving all 18 formats, including formats that may not deliver a discernible difference to their picture quality.

What is more, think of the amount of processing power that would be needed to decode all of these formats. Having to incorporate that processing power will significantly increase the cost of these TV receivers and hybrid PC-TV's by what we estimate to be as much as $500 to $600 per device, or an annual cost of approximately $10 billion, assuming consumer PC's are sold at the rate of at least 20 to 22 million a year. And I think we know as an industry a great deal about the cost of processing power. In fact, prohibitively high production costs will keep digital receivers out of reach for average

consumers, and slow the rate at which digital broadcasting becomes viable.

At one time the Grand Alliance technology may have been adequate for purely entertainment purposes. But with the convergence of TV's and computers well under way, it is now obsolete. And by the time many years from now that the average consumer is able to afford a set that can receive and decode all 18 formats, the technology will have been surpassed by a whole new generation, I am sure.

We all know that engineers are improving the capability of digital technologies relentlessly, so why perpetuate obsolete technologies for digital receivers when it is advancing so rapidly in many other industries, including our own? It would be like forcing tomorrow's cars to use break systems and suspensions developed in the 1980's.

Let us fast forward to the year 2000. Under the trajectory set by the Grand Alliance we see two undesirable consequences. One, more than half of American viewers will continue to watch analog TV. Two, valuable spectrum allocation to digital broadcasting will remain underutilized. The year 2000 does not have to be this way. Compaq sees an alternative, a simpler, less regulatory standard that would greatly reduce the cost of digital television receivers. We know Senator Pressler's bill envisions the Government not mandating a standard for digital broadcast television. From

where we sit, that approach is vastly preferable to the Government's mandating a standard with 18 different formats.

That said, let me underscore that Compaq and other members of the computer industry coalition on advanced television services oppose the FCC's adoption of the Grand Alliance standard. If the FCC decides that it should adopt any standard for digital television, we propose a minimal but liberally enhanceable baseline standard Our baseline standard would provide greater flexibility to broadcasters and equipment manufacturers. It would significantly lower consumer equipment costs. It would accelerate the use of spectrum for digital broadcasting, and more quickly free up spectrum for re-use that is now used for analog broadcasting.

For the past several months Compaq and other computer and software companies have been advocating an improved digital TV standard that combines the best elements of the Grand Alliance's proposal The result is a flexible-base layer format that would produce a huge qualitative improvement over today's analog TV's, yet at a cost that is a fraction of what is expected under the Grand Alliance proposal. Best of all, the computer industry's proposal would provide interoperability between computers and digital broadcasting, and accelerate the roll-out of affordable, interoperable products and services.

You may be wondering why Compaq cares so much about a

digital television standard. The answer is that the convergence of PC's and TV's is making digital TV transmission a very important part of the coming national information infrastructure. At least three major manufacturers, Compaq among them, have unveiled a new family of products that are best called hybrid PC-TV's. These devices, we feel, will revolutionize the way Americans receive, store, and process interactive information, and provide limitless opportunities for entertainment and education.

This is not pie in the sky. This is ready to eat today. PC-TV's are already on the market. And in the near future, many of us will see our homes transformed into intelligent network homes with the PC at its nerve center. For example, your living room PC, with its advanced digital display, might offer a 60-inch screen and hand a variety of contents that you have selected, and a whole local area network modeled after the one you use at work will enable a central home PC to drive displays in the study, the kitchen, the kid's rooms, and the family room.

We envision your home having far more interactive and diverse communication links to the outside world, including voice, voice services, paging, videoconferencing, electronic mail, online services, and Internet access. And PC-TV hybrids will enable you to pull in digital content on demand, along with a wealth of information and services, including

sophisticated commerce and banking, telemedicine, and even distance learning.

If next generation digital sets are less expensive and digital television is more family friendly, this day will be here before we know it. More consumers will be able to purchase a digital receiver sooner, and the digital TV will become a reality faster, we believe 5 to 7 years faster under the proposal that we offer today. Broadcasters will migrate to all digital transmission faster, and spectrum can be returned to the auction sooner. If Congress wants to maximize the benefits and minimize the cost to consumers and to taxpayers, it should join us in discouraging the FCC from adopting the Grand Alliance proposal that they offered today.

I would like to close by paraphrasing an important remark made earlier by Senator Ashcroft. We must stop protecting the past, and prepare to maximize the value of the future.

Thank you very much.

[The prepared statement of Mr. Stearns follows:]

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and augment that specification.

Indeed, many of the comments from my colleague here at Philips is true. They have left mechanisms where they want to provide for future enhancement. But it is the mixture of their process of defining it and getting it to become a government-mandated specification that we object to.

Mr. Hummell: Just on the area of aspect ratio again, Mr. Chairman, I remained baffled when I first got involved with this discussion a few years ago why the engineering community refuses to acknowledge the existence of Cinemascope film. There have been over 5000 films photographed in Cinemascope, and there have been more Cinemascope films photographed in the past 3 years than in the previous 15 years. So that kind of means more films are being photographed wider.

Here is an example of what gets cropped off in Cinemascope with the last supper. I have images here of many Cinemascope films. The last four years, the Academy Award winners for motion pictures have all been Cinemascope films. It is like saying okay, here is this work of art, this Rembrandt that is a work of art, but we are going to chop this off and cut it off to accommodate the smaller standards that are arrived at by engineers. I beg to differ as far as the involvement of the motion picture industry. I would love to know the directors and the cameramen involved in the process.

The Chairman: Okay now the computer industry

witnesses, Mr. Mundie from Microsoft and Mr. Stearns from Compaq, mentioned the introduction of PC-TV. One of the leading companies in America's computer industry, located in my home State, Gateway 2000, recently introduced a PC-TV. Would you please address this technology breakthrough, and the impact which the Grand Alliance standard would have on this development?

Mr. Mundie: I will comment first, and then Bob can add something.

Microsoft was actually closely involved with Gateway in the conceptualization of the product that they launched, which is called the destination series. This PC-TV is a combination of consumer electronics-like packaging and a very large screen computer display as the basis of observing the projected images, whether those images are computer generated or traditional television signals that have been received.

What is important to recognize is that it is a precursor of the kind of PC-TV's that we expect to occur when both the TV programming or media is in a digital form and the computer operations are in a digital form, all on a digital display. Today, it is a hybrid system in that it uses analog television and puts that onto a digital computer display.

Mr. Stearns: Mr. Chairman, Compaq is in the process of working with Thompson to develop a hybrid device which we refer to in the same category as a PC-TV, very similar to the